CLAIMS

WE CLAIM:

1.   An irrigation control system, comprising:
    a)   a computer;
    b)   a field controller linked to said computer for transfer of data therebetween; and
5   c)   a set of water valves arranged to be selectively turned on and off by said field controller;
    d)   said field controller including a clock, a microprocessor and a memory, said memory being connected to store scheduling data and run time setting data for the operation of said water valves,
10   and said microprocessor being arranged to operate said water valves in accordance with said clock and said data;
    e)   said computer being programmed to receive from an operator data representing desired watering schedules and run time settings for each water valve of said set, and to selectively transfer
15   said data to said field controller; and
    f)   said computer being further programmed to present to said operator a graphic of the time of day for a plurality of days, said computer receiving said data from said operator by placing water valve identifying indicia into selected positions on said graphic.

2.   The system of Claim 1, in which said memory is non-volatile.

3.   The system of Claim 1, in which said graphic includes:
    i)   a plurality of time bands extending in a first direction, each time band representing hours of a day, said time bands being juxtaposed in a second direction to represent a series of
5   days.

4.   The system of Claim 3, in which the current time is indicated by a line extending in said second direction across said time bands.

5.   The system of Claim 3, in which said graphic further incudes:
        ii)   a selectably displayable list of indicia representing the water valves of said set, watering schedules of said water valves being placed on said time bands by dragging and dropping indicia from said list onto said time bands in the form of schedule boxes having an edge representative of the start of watering and a width representative of run time.

6.   The system of Claim 5, in which said graphic includes directional arrows, and said displayed days are selected by clicking said arrows.

7.   The system of Claim 6, in which said schedule box can be expanded along its time band by dragging a trailing edge of said schedule box.

8.   The system of Claim 5, in which sets of schedule boxes in one time band can be copied to other time bands.

9.   The system of Claim 5, in which said graphic is arranged to display, whenever the cursor is placed over a scheduling box, a label showing the identity of the valve involved and its start and run time.

10.   The system of Claim 5, in which clicking on a schedule box displays a dialog box which allows the parameters of the schedule box to be changed.

15

11.   The system of Claim 5, in which said time bands each represent the 24 hours of a day, and said graphic shows seven time bands representing a repeating week.

12.   The system of Claim 5, in which said time bands are arranged in a series beginning with the current day and ending with the last day of a selectable repetition cycle, the displayed days of said repetition cycle being selectable.

13.   The system of Claim 12, in which said computer is adapted to send to said field controller scheduling data representing turn-on of a water valve at the time corresponding to a leading edge of a corresponding schedule box, and a turn-off of said water valve at the time corresponding to a trailing edge of said schedule box.

14   The system of Claim 5, in which alternate ones of said time bands can be selectively blocked to allow watering only on odd or even days.

15.   The system of Claim 5, in which said graphic further includes:
        iii)   watering inhibition indicia which, when clicked, inhibit watering on a specific day with which they are associated.

16.   The system of Claim 1, in which selectable portions of said graphic can be repeatedly enlarged without affecting the effect of said indicia.

17.   The system of Claim 1, in which said graphic contains an icon which, if clicked, causes the watering schedule defined by said water valve indicia to be suspended.

18.   The system of Claim 1, in which said graphic contains an icon which monitors the data link between said computer and said field controller, and signals a failure to receive from said field controller a response to a polling or data transmission by said computer.

19.   The system of Claim 1, in which said data representing desired watering schedules and run time settings is selectably transmitted to said field controller by clicking a transmit icon on said graphic.

20.   An irrigation control system, comprising:
    a)   a computer;
    b)   a field controller linked to said computer for transfer of data therebetween; and
5   c)   a set of water valves arranged to be selectively turned on and off by said field controller;
        d)   said field controller including a clock, a microprocessor and a memory, said memory being connected to store scheduling data and run time setting data for the operation of said water valves,
10   and said microprocessor being arranged to operate said water valves in accordance with said clock and said data;
        e)   said computer being programmed to receive from an operator data representing desired watering schedules and run time settings for each water valve of said set, and to selectively transfer
15   said data to said field controller; and
        f)   said computer being further programmed to selectably present to said operator a graphic having a time band representing time in a day, any watering schedule established on said time band being repeated at a selectable interval of days beginning on a
20   selectable day.

21.   The system of Claim 20, in wich said graphic further includes a calendar for a selectable month, with interval-selected watering days being marked by a watering icon.

22.   The system of Claim 21, in which watering days can be selectively inhibited, and in which a no-watering icon is substituted for said watering icon on inhibited days.

23.   An irrigation control system, comprising:
    a)   a computer;
    b)   a field controller linked to said computer for transfer of data therebetween; and
5   c)   a set of water valves arranged to be selectively turned on and off by said field controller;
    d)   said field controller including a clock, a microprocessor and a memory, said memory being connected to store scheduling data and run time setting data for the operation of said water valves,
10   and said microprocessor being arranged to operate said water valves in accordance with said clock and said data;
    e)   said computer being programmed to receive from an operator data representing desired watering schedules and run time settings for each water valve of said set, and to selectively transfer
15   said data to said field controller; and
    f)   said computer being further programmed to selectably present to said operator a graphic representing a selectable global adjustment of the run times of all said water valves programmed into said computer.

24.   An irrigation control system, comprising:
    a)   a computer;

b)   a field controller linked to said computer for transfer of data therebetween; and

5   c)   a set of water valves arranged to be selectively turned on and off by said field controller;

d)   said field controller including a clock, a microprocessor and a memory, said memory being connected to store scheduling data and run time setting data for the operation of said water valves,

10   and said microprocessor being arranged to operate said water valves in accordance with said clock and said data;

e)   said computer being programmed to receive from an operator data representing desired watering schedules and run time settings for each water valve of said set, and to selectively transfer

15   said data to said field controller; and

f)   said computer being further programmed to present to said operator a graphic in the form of a dedicated spreadsheet which, upon entry of the flow rate of each said water valve and the cost data of a known water consumption, calculates and displays the

20   water use and cost of the irrigation schedule using said desired watering schedules.

25.   An irrigation control system, comprising:

a)   a computer;

b)   a field controller linked to said computer for transfer of data therebetween; and

5   c)   a set of water valves arranged to be selectively turned on and off by said field controller;

d)   said field controller including a clock, a microprocessor and a memory, said memory being connected to store scheduling data and run time setting data for the operation of said water valves,

10   and said microprocessor being arranged to operate said water valves in accordance with said clock and said data;

e)   said computer being programmed to selectively transfer run time data to said field controller; and

f)   said computer being further programmed to present to

15   said operator a selectable set of graphics presenting indicia which,

19

when clicked, manually disable or run selectable ones of said water valves.

26. An irrigation control system, comprising:

a) a computer;

b) a field controller linked to said computer for transfer of data therebetween;

5   c) a set of water valves arranged to be selectively turned on and off by said field controller;

d) said field controller including a clock, a microprocessor and a memory, said memory being connected to store scheduling data and run time setting data for the operation of said water valves,

10   and said microprocessor being arranged to operate said water valves in accordance with said clock and said data;

e) said computer being programmed to receive from an operator data representing desired watering schedules and run time settings for each water valve of said set, and to selectively transfer

15   said data to said field controller; and

f) said computer being further programmed to present to said operator a graphic of the time of day for a plurality of days, said computer receiving said data from said operator by placing water valve identifying indicia into selected positions on said graphic; and

20   g) a remote linked to said field controller for transmitting commands thereto;

h) said remote including means for transmitting to said field controller only manual operation and disabling commands.

27. An irrigation control system, comprising:

a) a computer;

b) a field controller releasably linkable to said computer for transfer of data therebetween; and

5   c) a set of water valves arranged to be selectively turned on and off by said field controller;

d)   said field controller being a free-standing unit including a clock, a microprocessor and a memory, said memory being connected to store scheduling data and run time setting data for the operation

10   of said water valves, and said microprocessor being arranged to operate said water valves in accordance with said clock and said data regardless of whether said field controller is linked to said computer;

e)   said computer being programmed to receive from an operator data representing desired watering schedules and run time

15   settings for each water valve of said set, and to selectively transfer said data to said field controller memory when said field controller and computer are linked.

28.   The system of Claim 27, wherein said computer is linked to said field controller by a radio link.

29.   The system of Claim 28, wherein said data being transferred to said field controller includes an access code for allowing said field controller to accept said transferred data from any computer cognizant of said access code.

30.   The system of Claim 27, wherein said field controller is polled continually by said computer while linked thereto to inform said computer of the status of said field controller, and said clock is synchronized with the clock of said computer only as part of a

5   schedule data transmission to or from said field controller.

31.   The system of Claim 30, wherein said computer displays said status of said field controller unless said data has been modified on said computer but has not yet been transmitted to said field controller.

5